SOME NEW BOOKS.

An English Report on the Nicaragua Canal.

In a large octavo volume of more than 400 pages, entitled *The Keynote of the Pacific*, Messrs. Longmans, Green & Co. have published an account of the projected Nicaragua Canal, by ARCHIBALD ROSS COLQUHOUN, formerly Administrator of Mashonaland, and lately special correspondent of the London *Times* in Central America. This report is of particular interest, because it emanates from a competent and impartial observer, who, while appreciating the importance of the proposed canal, has formed a careful estimate of its cost. The book before us, in a word, embodies the results of an examination of the canal problem in all its bearings, mechanical, commercial, and political, made on the ground in the course of a journey through Nicaragua, from ocean to ocean, along the line of the prospective waterway. His observations have convinced the author that, owing to the competition of the United States, which is certain to become intense when the Nicaragua Canal is opened, the English will have to bestir themselves if they desire to maintain their commercial ascendancy in the Pacific. We shall here confine ourselves to noting what the author has to say about the engineering problem and about the commercial and political effects of the canal.

I.

The engineering problem involved in the undertaking is considered at length in two chapters collectively comprising nearly ninety pages. From a general consideration of this mechanical question in all its aspects, Mr. Colquhoun arrives at the following conclusions: In the first place, Nicaragua is free from the obstacles met with in other localities. We refer to such obstacles as high elevations in the cordillera separating the two oceans, requiring tunnelling; or to a high summit level requiring a large number of locks for which an adequate water supply is not obtainable; or to torrential streams, the constant control of which within reasonable limits is beyond the skill of the engineer. The author of this book also regards the route chosen as better than any other suggested within the territory of Nicaragua; it involves a smaller cost of construction, as well as a shorter and generally a wider and more commodious line; it is safe, too, as against the danger of destructive floods in a country where the rainfall is so heavy as to amount, in the aggregate, to 300 inches per annum. It is the conviction of this observer that the plan of arresting the floods in large basins and spilling them over weirs of great length, or through many sluices of large capacity, solves admirably the whole flood problem. This is pronounced the least costly way of constructing a large portion of the canal. The advantages of the Nicaragua over the Panama route are summed up thus: The proposed Nicaragua waterway is a fresh-water canal possessing a vast natural reservoir, the Nicaragua Lake; it passes through a region offering prospects of great productive development, free from the marshy soil, the overpowering heat, and the unhealthy climate of the Panama Isthmus; there is no Chagres River problem; and the "Divide" stands in a very different category from that to which the Culebra at Panama belongs; there is a trade wind all the year, bringing with it health; there is available, moreover, the valuable experience acquired at such cost at Panama; and, finally, there is at hand an accurate knowledge of what has to be done, based upon thorough and intelligent investigation. It is true that the problem of a ship canal with locks in a tropical country where the feeding streams are subject to sudden and violent floods, a problem first encountered on a great scale at Panama, confronts us here also, although under much less difficult conditions. The only serious difficulties are the Ochoa Dam, the Great Divide, and the Greytown Harbor. In Mr. Colquhoun's opinion, none of these is insurmountable. Generally speaking, the works on the Atlantic side are likely to give the most trouble, less, however, on account of their magnitude than by reason of the climate and rainfall. The inexhaustible water power available is looked upon as placing the Nicaragua route beyond the competition of its rivals, and it is pointed out that the material extracted from the Divide cuts will be useful for the dams, embankments, lots, and breakwaters. Now for the expense of the enterprise. After carefully going over the proposed plans of construction, and assuming that certain modifications mentioned will be made, the author is convinced that the total cost should not exceed $150,000,000. As to the time allowed for completion, six years is declared sufficient.

II.

The author of this book does not profess to be able at this time to foretell with accuracy even the direct and immediate commercial result of the redistribution of trade lines on a large scale. It is clear to him, however, that to every one in Great Britain as well as in the States the canal will make some difference, and that to many it will bring a great change. The completion of the waterway will be attended by not merely commercial but also political consequences, which, while they cannot be predicted even now with precision, were at least indicated by Humboldt more than seventy years ago. "The trade of the world," wrote Humboldt, "can undergo no great changes that are not felt in the organization of society. If the project of cutting the isthmus which joins the two Americas shall succeed, eastern Asia, hitherto isolated and secured from attack, will inevitably enter into more intimate connection with the nations of European race which inhabit the shores of the Atlantic. It may be said that that neck of land against which the equinoctial current breaks has been for ages the bulwark of the independence of China and Japan." Mr. Colquhoun points out that, to Englishmen, with their overwhelming interest in ocean traffic, the construction of the Nicaragua Canal must be of the first importance, bringing them, as it will, thousands of miles nearer to the Pacific shores of the New World, and presenting possibilities for the development of a new traffic which may prove as far in advance of present calculations as to to-day's traffic through the Suez Canal transcends the estimates of its ardent promoters. Even if it be conceded, a concession which the author declines to make, that for the first few years after its opening the canal might not prove a great financial success, it would prepare for itself an ultimate reward by the stimulus which it would give to existing trade and by the creation of an entirely new commerce between the Atlantic States and the far East. Not only will a new route be created, but fresh fields for the interchange of commodities will be open. Manifestly the canal will do away with the great geographical obstacle compelling the circumnavigation of Cape Horn; will place the ocean coasts of the United States ten thousand miles closer to one another, and will move the neutral competing zone of the Atlantic sea-borne commerce of the United States and of that of Great Britain from the Pacific coast of South America across to western Australia, and from the Pacific coast of North America to within the Pacific coast line of China. The canal, finally, will complete a perfect equatorial belt of navigation around the world through the artificial gateways of Suez and Nicaragua. No greater impulse to commerce could be given than by this American complement to the Suez Canal. With the resources now controlled by man, he can no longer suffer the narrow neck of land which joins the two Americas to block one of the principal trade routes of the world and to divert steamer traffic out of its coveted course by many thousands of miles.

III.

The opinions formed from every point of view, and a personal study of the proposed Nicaragua Canal in all its aspects, may be condensed in a few sentences. The projected waterway will render greater service to the New World than the Suez Canal does to the Old. It will bring Japan, northern China, Australasia, and part of Malaysia nearer to the Atlantic cities of the United States than they are now to England. It will benefit America in an infinitely greater degree than it will Europe, which will only use the canal in trading with the Pacific littoral of the two Americas, with the South Sea Islands, and possibly with New Zealand. It will divert little or no European traffic from the Suez Canal. It will give an immense impulse to American manufactures, especially those of cotton and iron, and will greatly stimulate the shipbuilding industry and the development of the naval power of the United States. If we are to judge from the Suez and Manchester precedents, it may cost more than the estimates show, but it will have a traffic greater than is usually admitted. The author of this volume, being an Englishman, wishes the canal to be neutralized and made an international highway, but to us it seems more probable that before the work is completed our Government will denounce the Clayton-Bulwer treaty and come to an agreement with Nicaragua and Costa Rica for a tripartite control of the canal, it being, of course, understood that the onus of protection would fall on the United States.

The book closes with the expression of a conviction that the canal can be made, and that, although long hindered by political busybodies, it is now destined to be carried out under the auspices of the United States Government. He holds the waterway to be a necessity of the age, and that although the cost should be double what he estimates it at, the immense benefit certain to result would amply justify the execution of the work. It will bind together by links irrefragable the remote sections of our vast republic, assimilate its diverse interests, go far toward solving many difficult problems of internal politics, and make the United States still more united.

The Development of the Iron Battle Ship.

Under the title of *Ironclads in Action*, Messrs. Little, Brown & Co. have published in two large octavo volumes a history of naval warfare from 1855 to 1895 by H. W. WILSON. An introduction, which is supplied by Capt. A. T. Mahan, U. S. N., indicates the scope and purpose of the work. In Capt. Mahan's opinion, what navies now need is not so much further advance in material development, in which, as a rule, all share alike, but more generally diffused and accurate knowledge of the results already obtained, an appreciation of the bearing of those results upon modern practice, and, finally, an application of the teaching of the past to this better knowledge of existing conditions. Of such knowledge the experience of actual warfare is the most important condition. How does the report of the battlefield correspond with that of the proving ground as to the resistance of armor to guns? What is the verdict as to the most efficient distribution of tonnage between larger and smaller vessels? To the knowledge of results as demonstrated by the test of war it is Capt. Mahan's opinion that the book before us gives valuable assistance by expounding in copious detail the various operations of all kinds in which ships have been engaged since 1855, when armor was first tested in action. The title, indeed, "Ironclads in Action," is narrower than the actual scope of the work, for the author has introduced several episodes concerning vessels to which the term *ironclad* cannot be strictly applied. But by collating the experiences of vessels of all kinds during the last thirty-five years, Mr. Wilson has produced a work which constitutes an appeal to history, and that at a period which, if distinguished by few exceptionally striking events, is yet that of the great transition in the condition of naval warfare that has so powerfully disturbed the mental processes and professional convictions of naval officers. In a preliminary note the author tells us that he has gone as far as possible to the original sources of information, and that he has personally inspected and visited most of the English ships and many of the French ships described. A considerable proportion of his space has been devoted to the naval events of the American civil war. The capture of Port Royal has been overlooked, but only because it teaches little that is not taught elsewhere. In chapters on the blockade and on the warfare against commerce during the war of the rebellion, Mr. Wilson has gone outside the strict limits of his title, but he pleads the extreme importance of the subjects as his justification. In the Franco-Prussian war it is rather the absence of action than action which is chronicled, but here what was not done is regarded as instructive to those who imagine that a fleet can capture fortified ports with little ado. A short sketch of the awakening of Japan is given to explain the moral superiority which gave the Japanese success.

We shall pass over the two hundred pages of the first volume, which deal with the use of armored vessels during the civil war, because with this part of the author's subject our readers are sufficiently familiar. The chapters to which we shall direct attention are those that treat of the battle of Lissa in 1866; of the naval operations of the Franco-German war and of the Russo-Turkish war; the naval actions which took place on the South American coast in the years 1877 and 1879; the bombardment of the Alexandria forts in 1882; the French naval operations in Tunisian waters and in the far East in 1881 and 1884-85; the naval events of the Chilian civil war in 1891 and of the Brazilian civil war in 1893-94; and, finally, of the naval engagements which took place in 1894-95 during the war between Japan and China. A word ought also to be said about ironclad catastrophes, which began with the foundering of the Captain, and ended in March of last year with the loss of the Reina Regente. We shall conclude our notice of this book with a summary of the progress made in ironclad construction.

I.

Few persons not professionally interested in the subject are aware that armored vessels were first employed in actual warfare on Oct. 17, 1855, in the capture of the Russian works at Kinburn. These works were situated on a long, narrow, and sandy stretch which runs from south to north athwart the wide and shallow estuary of the Dneiper. On the morning of Oct. 17 these works were attacked by the large fleet of the allies, operating in connection with the army that had been massed against Sebastopol. The English squadron consisted of six line-of-battle ships, seventeen frigates and sloops of war, ten gunboats, six mortar boats, and six transports. The French squadron included, besides four line-of-battle ships, three corvettes, four despatch boats, twelve gunboats, and five mortar boats, three armored floating batteries, 64 feet long by 42½ feet broad. The hulls of these batteries were of timber, upon which was superimposed iron armor four inches thick. They had a certain amount of deck protection above the casemate or battery, the deck over it being of oak plated with thin iron, and they had the germ of a conning tower in the shape of a bullet-proof iron shelter for the steersman, communicating with the engine room by means of a voice pipe. They were fitted with auxiliary steam power applied to a screw, and their funnel and bulwarks were arranged so that they might be taken down, and thus leave no projection above the armor. In the attack upon the Russian works at Kinburn these armored floating batteries were the decisive factor. Their projectiles were delivered at such a short range and with such telling effect that the Russian fortifications seemed to crumble under the impact. The only casualties suffered on board of these armored batteries were incurred through shot and splinters entering by the port holes. Otherwise they came out of the battle, which resulted in the surrender of the works, as fit for action as when they entered it. One of the armored batteries, the Devastation, had been hit thirty-one times on her side and forty-four times on her deck, but in no case was there more than a dent. "Everything may be expected from these formidable engines of war," wrote Admiral Bruhat in his official report. Not for another four years, however, did England awaken to the immense value of armor, whereas France set to work forthwith to reconstruct her fleet. The danger of such delay is seen in the fact that in 1861 England was weaker at sea than her more enterprising and inventive rival.

Lissa is an island which lies near the eastern coast of the Adriatic, about half way between Venice and Brindisi. The hopes of Italy had already been blasted by the defeat of her army on land at Custozza, and even more discredit fell upon her navy on July 20, 1866, in the battle which took place off the island of Lissa. In this action Persano, the Italian Admiral, had under him a fleet consisting of twelve ironclads, besides seventeen wooden vessels, six of which were frigates. While the Italians were engaged in bombarding the fortifications of Lissa, they were themselves attacked by the Austrian Admiral Tegetthof, commanding seven ironclads and a number of wooden vessels. If the material of the two fleets be compared, the figures will be found to be greatly against Austria. In ships the Italians had a proportion of almost exactly two to one: in number of guns, 1.66 to 1; in tonnage, 2.64 to 1; in horse power, 2.57 to 1. Judged by ships alone, Austria could have no hope of success, nor if we look at men did her prospects appear brighter. Her sailors were Italians or Dalmatians; of the former nationality were eight hundred men from Venice itself, who might be supposed to be thoroughly untrustworthy; even the Dalmatians, although loyal to the House of Hapsburg, were not altogether to be relied upon. So inspiring is a great personality, however, that Tegetthof, from the first, had no difficulty with his men. They were ready to follow him, even against their own kith and kin. The result of the battle is well known. The Austrians lost not a single ship, whereas two of the Italian ironclads foundered during the fight, and a third, the Affondatore, sank a few days afterward in Ancona harbor. Mr. Wilson's comment on the action is that Italy chose the royal road to defeat. She had built a great ironclad fleet, without training officers and men to handle them. She forgot that ships alone are valueless, and that Armstrong guns, be they never so heavy, must have men behind who can shoot straight. She forgot to train her Admirals, as she forgot to train sailors. She had no naval staff with information and plans of action ready. At the supreme moment she selected in Persano a commander of Chinese dilatoriness and incapacity. Destitute of moral fibre, and devoid of military qualities, though not, it would seem, altogether of courage, this most unhappy of Admirals went forth to defeat, was defeated, and then threw the blame on his subordinates, after he had vainly striven to hide his dishonor in a cloud of boastful and untrue despatches. As regards the tactics of the Austrian Admiral, Tegetthof, it is pointed out that he achieved his purpose, which was to throw a mass of ships on one point, and by superior handling of his inferior force to neutralize his opponent's predominance in strength.

II.

As regards naval operations during the Franco-German war it is noteworthy that the French, although immensely preponderant, did not capture a single fortified German port on the North Sea or on the Baltic, and only one encounter took place between ships. This occurred in the West Indies between the German gunboat Meteor and the French gunboat Bouvet; it ended in the Bouvet's hoisting sail and retiring, while the Meteor endeavored, but unsuccessfully, to pursue her. The loss of the Bouvet was ten men killed or wounded, whereas the Meteor had but two killed. It is thus evident that the French navy during this war performed no brilliant deeds of arms at sea. On land, nevertheless, Admiral Jaureguiberry, the sailors, and the marine infantry won great distinction, and proved that the personnel of the fleet lacked neither courage nor enterprise. On the water there was only inactivity and discouragement, yet it is not to be inferred that no services were rendered by the fleet. In the first place, French commerce was perfectly protected, whereas any German ships that ventured to sea did so at great risk. France was thus enabled to import arms and ammunition from abroad without any interference, making up in this way for the shortcomings of her own arsenals. Her line of communication, moreover, between Toulon and Algeria, was never threatened. In the second place, the mere menace of a French expedition to the Baltic detained four Prussian army corps in Germany up to July 27, when their places were taken by four divisions, as it had become evident that Denmark would not join France. Although, after a few weeks of war, these troops could be sent to the front, the naval power of France must none the less receive credit for neutralizing 120,000 trained soldiers at a time when their absence would have been surely felt, had France actually possessed on land a strength corresponding to her forces upon paper. In the third place, the German coast was, if not strictly blockaded, held under observation without any misadventure to the French; and though isolated ships like the Arminius and the Augusta were able to elude the French, this was only what repeated incidents in the American civil war had shown to be possible, even with a strict and vigilant blockade upon a coast where the blockaders had bases of supply and repair. We observe, finally, that the lesson of the Franco-German war, from a naval point of view, is that fleets can effect nothing beyond a blockade on a hostile coast, if that coast is difficult of access and well fortified, unless there is an army behind the navy. This obviously is a lesson which the United States should take to heart in view of a possible war with England, which would be powerless to injure us, provided our chief seaports were adequately fortified.

When Russia declared war in April, 1877, against Turkey, the latter power was the possessor of a fleet overwhelmingly superior. The Russian navy labored under great disadvantages; one-half of its ships were in the Baltic, far removed from the scene of action, and unable to enter the Black Sea; the rest of the Russian fleet was absent on the Atlantic, or the distant Pacific stations. In the Mediterranean was a small squadron, but the same causes which kept the Baltic fleet inactive operated here also. Russia was thus unable to concentrate her naval strength, and had to concede to Turkey the command of the Black Sea. Her only ironclads in that basin were the two "Popoffkas," or circular barbette ships, incapable of steering or steaming. They could not be trusted at sea, and were used only for harbor defence. Add to these a few old and worthless corvettes and sloops, a dozen or more torpedo launches, and a number of fast merchant steamers purchased for the purpose of conveying torpedo boats, and we have the war fleet of Russia in the Black Sea. Only one encounter between ship and ship took place during the war. This was an attempt of a Turkish ironclad, the Assar-i-Chevket, to capture the armed merchant steamer Vesta while the latter was cruising off the coast of Roumelia. The attempt was unsuccessful, owing to a lucky Russian shot which struck the ironclad's conning-tower. The Russian attacks upon the port of Batum were equally unsuccessful. We should not, however, underrate the influence of sea power, even upon this war. Had Russia, instead of Turkey, possessed the superior fleet, there would have been no Plevna, no desperate actions on the Lom, and the world would not have had cause to wonder at Gen. Gourko's dash on Roumelia. On the contrary, the Russians, striking at Constantinople, the heart of the Turkish empire, would have split the Sultan's dominions, and quickly and easily finished the war. As it was, not only were they unable to send troops by sea, and thus to turn the Danube and the Balkans, but their provisions, stores, and supplies as well as soldiers had all to travel overland by the single railway which descended Moldavia to Galatz. This railway, moreover, was dangerously exposed to the Turkish flotilla on the Danube, which, if used with vigor and discretion, might have destroyed it where, between Galatz and Braila, it passes close to the great river.

III.

Considerable space is devoted to the engagement between the Shah and the Huascar, which took place on May 29, 1877, because the former was an unarmored cruiser, whereas the latter was an ironclad. The Huascar was an iron turret ship of 1,800 tons displacement and 11 knots speed. She was protected on the water line by wrought-iron armor 4½ inches, 3½ inches, and 2½ inches thick. Her single turret placed amidships, rather forward, was of the Coles pattern, travelling on a rollerway, and protected by 5½-inch plating. In it were two old-pattern 10-inch, 12½-ton Armstrong muzzleloaders. On her quarter-deck, without any armor protection, were mounted two 40-pounder and one 12-pounder, muzzleloaders. She carried one tripod mast, on which was a military top, protected by a breast-high plate of boiler iron, and containing one Gatling gun. The Shah, on the other hand, was a very large iron unarmored cruiser of 6,250 tons. Her trial speed was 16.4 knots. Her armament was a formidable one, and such as it was thought would enable her to deal even with armored vessels. On her upper deck she carried two 9-inch 12-ton muzzle-loaders, pivots, and eight 64-pounders; on her main deck, sixteen 7-inch guns and two of similar pattern, 8-inch size. The weight of her broadside was 1,680 pounds in fourteen projectiles. In her three tops she carried Gatling guns, and she had two launching carriages for Whitehead torpedoes. She was assisted in the engagement by the Amethyst, another unarmored cruiser, carrying fourteen 64-pounders, muzzleloaders. The British commander had decided to compel the surrender of the Huascar, because, the crew of that vessel having mutinied against the lawful Peruvian Government, she was little better than a pirate. The fight between the ironclad Huascar, on the one side, and the unarmored vessels, Shah and Amethyst, on the other, lasted from 3:06 P. M. until 5:45 P. M., without serious injury to any of the combatants. The next day the Huascar surrendered to the Peruvian fleet, and her existence as a pirate was over. She had been struck by sixty or seventy shots, several of them being 64-pounder projectiles, yet she was not in the least injured. Neither the Shah nor the Amethyst had a single hit on their hulls, and all the damage inflicted upon them was the cutting of a few ropes in their rigging. Bad gunnery on the part of the Peruvians can alone explain this, since they had a very large target in the case of the Shah, and a good-sized one in the Amethyst. On the other hand, notwithstanding the immense superiority of force on the part of the British vessels, they failed to capture or destroy the ironclad. Owing, however, to the improvement in artillery, our smaller cruisers' guns could now pierce the Huascar's mail. No modern battle ship is so invulnerable to small guns as were the monitors and turret ships of the period from 1861 to 1875. At the same time it is just as hazardous a proceeding as ever it was for the unarmored cruiser to assail the ironclad, or in other words, to go out of her class.

The war between Chili and Peru (1879-81) is interesting from a naval point of view on account of the astonishing battles between the Peruvian ironclads Huascar and Independencia and the Chilian unarmored ships Esmeralda and Covadonga. The Huascar has just been described: the Independencia was a vessel of about 3,500 tons, protected by 4½ inch iron armor. Her battery consisted of two 150-pounders, twelve 70-pounders, and four 30-pounder muzzle-loading rifle guns, to which, on the outbreak of war, were added one 250-pounder and one 150-pounder. The Chilian Esmeralda, on the other hand, was an old wooden vessel, armed with fourteen 40-pounder muzzleloaders; her consort, the Covadonga, was a small wooden steamer captured from the Spaniards in 1866, of six knots speed, and armed with two 70-pounders. The Esmeralda, however, was commanded by Arturo Prat, an officer of the most determined, courage and of great professional ability. The action, which took place on May 21, 1879, began at 8 A. M., and lasted about four hours. The Esmeralda, having repeatedly tried to board the Huascar, was rammed for the third time and sunk about midday. About a quarter of an hour before, the Independencia had been lured by the Covadonga on a rock, and had to be abandoned and burned. The small wooden steamer Covadonga escaped unhurt; the ironclad Huascar, on the contrary, had received very considerable damage from the Esmeralda, her bow plates, with their backing, having been broken, and her turret having been forced out of the centre line. The engagement, taken as a whole, reflects the highest credit upon the Chilian officers, gunners, and sailors. No less noteworthy was the battle of Angamos, between the Huascar, on the one part, and the Chilian ironclads Blanco Encalada and Almirante Cochrane, assisted by the small wooden steamer Covadonga, above mentioned. Here the heroism was displayed on the side of the Peruvians. The killed and wounded on board the Huascar numbered sixty-four, that vessel having been hit by heavy projectiles twenty-seven times. The turret was perforated twice; the conning-tower was struck three times, and five heavy shells exploded between the decks. On the other hand, the Cochrane was hit but thrice and the Blanco was entirely untouched. In this battle there were five attempts to ram, three made by the Cochrane and two by the Huascar, but all were unsuccessful. Mr. Wilson's deduction from this battle is, that in practice it will be found impossible to ram a ship on open water so long as she is under control.

IV.

We pass to the bombardment of Alexandria, which was undertaken on July 11, 1882, by a powerful British squadron under the command of Admiral Sir Beauchamp Seymour. This squadron is pronounced a formidable one, though it did not include any monitors of the Devastation type, which might seem particularly suitable for an engagement with forts, inasmuch as they are heavily armed and armored. The attacking fleet on this occasion was composed almost entirely of high freeboard, central box-battery ships, of the type widely favored between 1868 and 1878, a type of ship which, with its complete belt, its considerable extent of thin armor, and its armament of moderate-sized guns, is yet capable of doing great things, given good guns and modern engines. The ironclads at the disposal of the English Admiral were the Alexandra, the Inflexible, the Sultan, the Superb, the Temeraire, the Invincible, the Penelope, and the Monarch. The armor carried by the ships ranged from 24 inches thick on the Inflexible to 4½ inches on the Penelope. The guns were muzzle loaders of the Armstrong pattern, though these were supplemented by numerous 20-pounder breechloaders, small quick firers of Nordenfeldt make, and Gatling machine guns. In all, these ironclads brought to bear on the broadside four 81-ton, eight 25-ton, nineteen 18-ton, eight 12½-ton, five 9-ton, and numerous smaller guns. The weight of one discharge on the broadside from the heavy guns was about 22,500 pounds, divided among 44 projectiles. Assisting the ironclads were five unarmored gunboats, mounting 4½-ton and 64-pounder muzzleloaders, with small breech loaders. The forts which were to be attacked extended from east to west in a direct line eight miles. The total number of guns mounted on them reached 44 rifles, 211 smoothbores, and 38 mortars. The weight of one discharge from the rifles was about 9,400 pounds in 44 projectiles. The smoothbore guns were antiquated weapons, and could not, under any circumstances, be expected to perforate the thinnest armor afloat in the English fleet. The Egyptians had plenty of submarine mines, but, owing to the presence of the ironclads inside the harbor, and the vigilance of Admiral Seymour, had not been able to lay any down. They had also an abundance of ammunition, whereas the English supply was limited, and consequently the ships had to be careful not to waste a shot. The fight began at 7 o'clock on the morning of July 11, and ten minutes later all the ships were firing and all the forts within range were replying. The Egyptians fought with unexpected gallantry, and it was not until 5:30 P. M. that the signal to cease action was made. The forts now appeared to be a mass of ruins, and on the following day the white flag was hoisted by their defenders. The English losses were exceedingly small, amounting to only five killed and twenty-eight wounded. The Egyptian losses, on the other hand, have ben variously estimated at from 300 to 2,000. The damage to the English ships was also singularly small. In no case was the thinnest armor penetrated, or sufficient damage done to prevent any ship from reëngaging. A subsequent close inspection of the forts revealed the startling fact that, serious as their injuries had seemed to be from the sea, they were not, in reality, crushing, and that, with certain easily effected repairs, almost all of the guns might have been fought again. Excluding self-inflicted harm from violent recoil, upsetting improperly secured guns, only ten rifled weapons had been silenced by the fire of the fleet. There can be no doubt that the heavy artillery of the ships achieved much less than had been expected from it. The huge shells of the Inflexible, with a bursting charge of sixty pounds of gunpowder, produced very little effect against earthworks. It is, therefore, idle to imagine that because Sir Beauchamp Seymour reduced the Alexandria works with comparative ease, similar success could be attained against forts garrisoned by troops of skill and morale, and armed with artillery that could match the fleet's. On the whole, Mr. Wilson does not deem it probable that in future wars bombardments such as that of Alexandria will be repeated. The odds in favor of the shore force have grown too great, and the difficulty of supplying ammunition to ships is too overwhelming.

V.

It will be remembered that in 1881 a difficulty with the Khroumirs, a Tunisian tribe on the Algerian frontier, was made the pretext for asserting a French protectorate over Tunis, to which the Bey assented. The Arab population, however, was by no means ready to submit to France, and the seaport town of Sfax was seized and occupied by the insurgents. On July 15, 1881, the town was bombarded by a French squadron, which comprised eight ironclads, together with three unarmored cruisers and a number of gunboats. The fire maintained by the ships was slow and steady, and did much damage to the town. On the next day, the 16th, the landing party, numbering 3,000 men, succeeded in occupying the place. The French loss was not heavy, amounting, in all, to eleven killed and fifteen wounded. The attack upon Sfax is described as well conceived and well executed; but, of course, little resistance could be offered by the Arabs to the powerful artillery of the French squadron. Here, even more than at Alexandria, the attacking force was so much stronger than the defence that the result of the fighting was bound to be one-sided. No damage was done to any of the ships. Three years later, and before the Chinese Government had issued a declaration of war against France, a French squadron, under Rear Admiral Courbet, ascended the River Min, on which stands the city of Foochow, where was the most important of the Chinese naval arsenals. The ships which Courbet commanded included the Duguay-Trouin, a large, composite cruiser, the Villars and D'Estaing, both wooden, third-class cruisers, the Volta, a wooden sloop of war, and three gunboats, all composite and each of about four hundred and fifty tons displacement. In addition, at the mouth of the Min, lay the armored cruiser Triomphante, a central battery and barbette vessel, protected by iron armor 6 inches to 4¾ inches thick. Her commander had Courbet's permission to attempt the ascent of the river. Two torpedo boats were present with the squadron. The French crews numbered eighteen hundred and thirty men in all. About a mile below Foochow, on Pagoda Point, were Chinese batteries, while other works protected the arsenal, which is two thousand yards further up the river. In the River Min was moored a considerable Chinese squadron, comprising one composite cruiser, six wooden sloops of war, two transports, two Rendel gunboats, seven launches fitted with spar torpedoes and eleven war junks sailing vessels, armed only with smooth bore guns. The flotilla carried only eleven hundred and ninety men, and the weight of metal discharged at one time was under forty-five hundred pounds, as against six thousand pounds discharged by the French squadron. The French had thus a superiority of one-third, which would probably have given them the victory over well-trained opponents, but the men whom they were to fight had neither skill, discipline, nor courage. The French attacked at 2 P. M. on Aug. 23, 1884, and by 4 o'clock the Chinese squadron was practically destroyed. Then, however, the land batteries, to which the French had been exposed during the engagement, redoubled their exertions, and about 5 P. M. the fleet anchored for the night out of range. On the following day the French once more bombarded the arsenal, and subsequently, after silencing the forts commanding the narrows in their rear, retired safely to the China Sea. This fight is usually described by French writers as a splendid achievement, but, in point of fact, it should be placed in the same class with the bombardment of Alexandria, and no inference can be drawn from the operations as to the result which would have followed a defence of the works and of the Chinese supporting squadron by a less contemptible enemy.

VI.

Of a certain interest are also the naval events of the Chilian civil war, which broke out in January, 1891, when the Chilian fleet declared against the government of President Balmaceda, who was accused by the Congressional party in Chili of aiming at a dictatorship. President Balmaceda was left without a sea-going war ship on the coast, but he armed the Imperial, a mail steamer, and he had a dozen torpedo boats of various patterns, mostly equipped with spar torpedoes. He also held the forts of Valparaiso, where numerous heavy guns were mounted, and had at his back an army of 40,000 men. Among the vessels of the Congressionalists were the three ironclads Blanco, Cochrane, and Huascar, referred to in a preceding paragraph. All three had been rearmed with the 8-inch Armstrong breechloaders, and two of them carried each four 6-pounder quick-firers, 4 Nordenfelts, and 2 Gatlings, in addition to their heavy guns. The speed of none of the three, however, can have exceeded eleven knots. Perhaps the most formidable vessel of the squadron was the Esmeralda, a fast, protected cruiser, launched at Newcastle in 1884, of 3,000 tons displacement, and 18.3 knots speed. Fore and aft were mounted 10-inch 25-ton breechloaders, and amidships six 6-inch breechloaders, three on each side, in sponsons, with steel bullet-proof shields. The other Congressional ships took little part in the struggle. The Aconcagua, however, deserves a word; she was a mail steamer of 4,100 tons, and had been armed with two 5-inch guns, one 40-pounder, and several machine guns.

When Balmaceda's small squadron had been strengthened by the arrival of two torpedo gunboats from Europe, they, in company with the Imperial, left Valparaiso to attack the Congressionalist vessels at Caldera. The attack was to this extent successful, that one of the gunboats hit the ironclad Blanco amidships with a torpedo and sent it to the bottom. The gunboats then left the Bay of Caldera, apparently uninjured. This was the first occasion on which the Whitehead torpedo was successfully employed against an ironclad; at least, it is the first as to which we possess full details. Once before, during the Russo-Turkish war, a ship had been sunk by it, according to the assertions of the Russians, but the Turks denied the loss. Now the fact was beyond dispute, for the hull of the sunken ship could be seen and examined. Here, again, we encounter exceptional circumstances which would not be likely to recur in a European conflict. For an ironclad to be at anchor without nets out, without launches to protect her, without a search light, and with a very insufficiently trained crew points to singular carelessness on the part of her commander, especially as he had had warning of the approach of the torpedo boat. If captains choose to imperil their ships as the Blanco was imperilled, they will lose them; but French, English, or American ironclads are not likely to lie in open harbors without taking the most elementary precautions. The Chilian civil war is of some importance from a naval point of view, not only because the Whitehead torpedo for the first time sank an ironclad, but also because of the admirable strategy of the insurgents. They used their fleet sparingly against fortifications, making no attempt to capture Valparaiso by bombardment from the sea. They recognized the truth, sometimes forgotten, that fleets cannot act on land, though they do exercise a very marked influence on land action. They were confronted by a force which lacked all capacity of action, except by surprise, and they showed that such a force is powerless to change the issue of a war, though it may destroy individual ships.

A chapter is devoted by Mr. Wilson to the civil war in Brazil, which began in September, 1893, and ended in April, 1894. He does not consider, however, that the contest added greatly to our knowledge. It simply showed that an improvised fleet without trained seamen is a most untrustworthy instrument, but that is a self-evident fact. It showed that armored ships can pass forts with impunity if there is an unobstructed channel, but a long series of actions had already proved this. In a footnote, however, the author recognizes the possibility that the pneumatic gun will impair, if not annihilate, such impunity, where the channel to be defended is narrow. This gun can be absolutely concealed, and is able to fire a shell a minute. The explosive charge of the shell is extremely heavy, and one hit should disable any man-of-war afloat. Of course where there are obstructions in the channel, where there are mines or bombs to hold the ships under fire, the attempt to traverse such a channel is venturesome, not to say impossible. As regards the Brazilian contest, we are reminded that Marshall Peixoto's forts were not armed with heavy, quick firers, and that the powder used in the guns was very bad. The insurrection collapsed, not through any masterly activity on the part of the President of Brazil, but rather through the incapacity of the Mello-ist leaders, and the fact that they could not collect an army. A fleet without an expeditionary force behind it is only valuable for defence, and lacks offensive power. Modern war ships do not carry the crews of three-deckers, or even frigates, and have lost the power of landing a considerable body of men. The complements are barely sufficient to work the ship, and no men can be spared without risk.

VII.

To the naval aspects of the war between Japan and China Mr. Wilson allots some eighty pages. We shall not, however, dwell on this part of his second volume at length, because we recently had occasion to discuss the subject in a review of a Russian account of the China-Japan war. We should not, however, overlook two or three of the inferences drawn by the author from the outcome of the fight at the Yalu, the first important battle since Lissa, in which a number of ironclads took part, and in which the elaborate contrivances which have replaced the line-of-battleships were tested at sea in a general action. For instance, it had been expected that the losses in such a battle would be very heavy, yet it cannot be said that this expectation was altogether justified. The Japanese lost in killed and wounded 294, but their total force of sailors engaged could not have been much less than three thousand. The Chinese loss on board the ships which survived the encounter was not so heavy as that of the Japanese, but a very large number of men were killed, wounded, or drowned on board the ships which went down. Mr. Wilson thinks it no exaggerated estimate to place the number of lives thus lost at from 600 to 800. This loss of life might have been greatly diminished had special vessels been at hand to rescue the drowning in the water. Both at Lissa and at Yalu the greater proportion of deaths on the beaten side were due to drowning. It goes without saying that the special vessels of which the author speaks would not be armed, and would be distinguished in some way, by color or build, from the combatants. When the enemy's sailors are in the water they are as helpless as if they were wounded, and, since ambulances are not fired upon, why should not all possible immunity be given to ambulance ships? It seems that the importance of this point was fully understood by Tegetthof, who was anxious, after Lissa, that a European conference should be called to deal with it.

From the tactical point of view, two very surprising features are noted at the battle of the Yalu. Neither the ram nor the torpedo scored a single success. The explanation of this is that the Japanese, with their superior speed, and the mobility which obedience to signals conferred upon them, deliberately decided against both these arms. To use the rams, ships must obviously come to very close quarters, and as, during the battle, the Japanese, with a few exceptions, kept at a distance of over 2,000 yards, it was impossible for the Chinese to ram. The torpedo proved equally useless. The Chinese ships engaged carried forty-four tubes, but these, with their accompanying supply of torpedoes, were so much dead weight, conveyed for no purpose, except to endanger the ships which bore them. It is questionable whether the Chih Yuen struck a live torpedo floating in the water, or whether a torpedo in one of her tubes was exploded by a Japanese shell. The torpedo boats which the Chinese possessed also effected nothing during the action. They did not dash into the battle under cover of the smoke and uproar, and fall upon their enemies, as had been prophesied. At the close of the day, however, the one Chinese torpedo boat still available did modify the tactics of the Japanese, since the mere possibility of a night attack upon his worn-out crews decided Admiral Ito against a close pursuit. Thus, if the torpedo proved ineffective in the battle, the influence of the torpedo menace after the engagement must yet be acknowledged. It is a fact not to be lost sight of that the Japanese were able to make full use of signals under fire. It is most important to know that signalling is possible in battle, but Mr. Wilson doubts whether, with good gunnery on both sides, there would be many signal men left after a few minutes, for they are generally much exposed. The same thing may be said of signalling gear. The Japanese shot away the halyards and masts of their opponents, and, if they did not suffer the loss of their own gear, this was due to their enemy's indifferent marksmanship. It would be rash, therefore, to conclude that it would be possible to communicate orders in a western naval engagement, after the battle is fairly joined. From the action at the Yalu, some have drawn the deduction that the unarmored ship can face and defeat the ironclad. Mr. Wilson holds the contrary opinion. Doubtless the Japanese fleet was, for all practical purposes, an unarmored one, while the Chinese included two well armored ships. But the author submits that the real test which enables us to discriminate between the resistance of armored and unarmored ships is afforded by the behavior of these two different classes in the Chinese fleet, where both cruiser and ironclad had to withstand the hail of 6-inch and 4.7-inch shells, with an occasional shot from a heavier gun. The two Chinese ironclads came out of the encounter much battered, but still battle-worthy. Their stout platings stood them in good stead. They could still manœuvre and fight their guns, while the loss of life on board them was small, considering the vehemence of the attack delivered upon them. Not so with the unarmored ships; of the eight in line, two fled before they had been punished; one withdrew in flames, one was sunk by collision, and three were sunk or hopelessly damaged by the Japanese fire. One only fought through the battle and survived it without serious injury. So far, then, from demonstrating the superiority of the unarmored ships, the sea-fight at the Yalu has shown that armor is necessary for ships which are to figure in the line of battle.

VIII.

In a final chapter the author sums up the results of thirty-five years of progress in battle-ship construction. The progress has not been continuous in England, or, for that matter, in any other country. Mr. Wilson contends, however, that English ironclads, as a rule, show a steady advance, each being better than its predecessor and closely related to it, though he admits that certain types have appeared from time to time and died out, because they proved unfitted for the conditions of war, or because the development of naval opinion discarded them. The descendants, for instance, of the Royal Sovereign, the first English turret ship, have displayed a great mortality. Four varying types have appeared from time to time, and three of these may be said to have died an early death—the low freeboard, masted turret ship, which expired with the Captain; the single-turret ship, which disappeared with the Victoria, and the "echeloned" turret ship, of which the Colossus is the last example. On the other hand, the mastless turret ship of the Devastation type has evinced a singular vitality. After the Dreadnought, launched in 1875, it did not appear for twelve years, when, just as it might appear defunct, it turned up again in the Nile and Trafalgar, and from them has handed on some of its features to the later Majestic class. The tendency toward high freeboard and good speed in recent English battle ships is well marked. Both these features characterized the older ships, but the rage for impregnability drove them out. Experience has taught that, admirable though the mastless monitors of the Devastation type were as fighting machines, a ship has other things to do besides fighting. She must be fairly comfortable, if her crew are to retain their health; and, without health, the sailor must necessarily lose a great deal of his nerve. High freeboard ships of the Warrior type, in which the crews need not be battened down in a moderate sea, become essential when it is desired to maintain in good physical condition the men who have to fight and work the ships. Nor is this the only gain which the high freeboard gives. When the guns are placed very low, the waves in rough weather may cut off the enemy's hull from sight, and seas breaking over the forward part of the ship may bury the forward turret or barbette in spray and foam. It must be conceded, on the other hand, that the low freeboard ship is a small target to hit, a fact which was remarked by the Shah's gunners when they faced the Huascar. Still, the advantages of a high freeboard are greater than the disadvantages, and the high freeboard seems to have come to stay.

The early ironclads had to face guns of comparatively feeble power. The subsequent increase in the thickness and resisting power of armor was entirely due to the improvement of artillery. The gun, however, outstripped the armor, and, before a ship had left the stocks, has usually rendered it, in a sense, obsolete. Another fact to be recalled is that the first armor was uniform in thickness. Then, as the attack grew more formidable, and the weight of iron to give protection greater, a greater thickness was given to the vital parts of the ship. None of the older English vessels were really "ironclad," and it goes without saying that none of the modern English battle ships are such. The low freeboard turret ship of the period 1870-5 are the only English vessels to which the term can be correctly applied. It was found necessary with high freeboard ships to denude a great portion of the side of armor, in order to increase the thickness over the battery and vitals. This denudation reached its extreme limits in the Inflexible and the "Admirals," where there are absurdly small patches of plating, and where by far the greater portion of the side is open to the smallest shell. It was the aim of their architects to keep out the heaviest projectiles from certain portions of the ship, but, in their effort to insure this, they went too far. Why, it may be asked, is not a ship made invulnerable? It could be done, but not probably with a displacement smaller than that of the Great Eastern. The danger of destruction by the ram or torpedo forbids such a monster, and, as a ship has, after all, to fight other ships, she will find them, if they are of her date, and, if she is well planned, as vulnerable as herself. If she cannot resist every projectile, neither can they; if her upper works can be riddled, so can theirs; if she is open to the deadly assault of ram and torpedo, so also are they. The naval architect's business is, given a certain displacement, to effect the best compromise between the warring factors, speed, stability, power to wound, invulnerability, coal endurance; or, given the required degree in which these factors must be present, to produce them on the lowest displacement. A battle ship of fifteen thousand tons may look to the casual eye no better than one of ten thousand tons, but, as constructors are not idiots, there is something somewhere which will give the larger ship the advantage. It may be a heavier and stronger hull which will wear better, and stand the tremendous concussion of the guns longer; it may be a surplus of ammunition or coal. One may quarrel with the constructor for giving insufficient attention to one factor or another in his compromise, but it can rarely be said that, with a higher displacement, he has produced an inferior ship. It must, however, be acknowledged that the growth in displacement is one of the most striking features of recent battle ships. Seeking perfection, and striving to improve each type before it has entered the service, naval constructors have been driven to greater and greater size. By the author of the book before us the fact is pronounced regrettable, inasmuch as numbers are shown by naval history to be a more decisive factor than the size of individual ships. There must be a limit to this increase of size, and Mr. Wilson is inclined to think that we have reached it. Overgrown ships are not less objectionable than overgrown guns and overthick armor. M. W. H.

NOT DRY FOR COL. WATTERSON.

Even in Evanston There Was a Cure for His Slight Huskiness of Voice.

From the Chicago Times-Herald.

Evanston hospitality has won a new triumph, but breathe it not in Evanston and tell it not in the streets of Chicago. Henry Watterson lectured Thursday night on Abraham Lincoln, under the auspices of the local post of the Grand Army of the Republic. The meeting was held at the First Methodist Church. The speaker was presented to the audience by Dr. Henry Wade Rogers, President of the Northwestern University, and this pleasant service may have carried with it a responsibility for Evanston's hospitality.

Mr. Watterson spoke long and eloquently, and when he finished a happy thought struck a gentleman who had a "Here's-to-you" acquaintance with the orator. Plucking Dr. Rogers by a buttonhole and drawing him aside, he asked:

"Don't you think Mr. Watterson would like a—some refreshments?"

"Refreshments? Why, certainly." The Doctor said, with smiling cheerfulness, that he would attend to it. But the Doctor's prompt response and smiling countenance filled the friend with distrust.

"By the way, Doctor," he suggested, in a halting, apologetic tone, "I don't think Mr. Watterson would like either lemonade or soda water."

A look of surprise and inquiry crept into the good Doctor's face, and the gentleman bent on hospitality continued:

"You understand, Doctor, don't you, that pop isn't a popular refreshment in Kentucky?"

An expression of sudden comprehension flashed across President Rogers's face, and he "ummed" and "ahed" with some show of embarrassment, but he quickly rallied. It should not be said that Evanston hospitality had failed in its attentions to the sponsor of the star-eyed goddess of reform. The Doctor's personal knowledge of Evanston's resources was not equal to an immediate solution of the problem before him, and he instinctively turned to the club. Wasn't the club the centre of good fellowship, and couldn't he hope to find there some friendly aid? He felt it was uncertain, but it was his only hope. So Mr. Watterson and his inseparable companion were trotted over to the Evanston Club.

Mr. Watterson found greetings for himself at the club, but there was nothing to make it pleasant for his Kentucky thirst. Evanston thirsts have been trained to remain outside, like dogs and gum shoes, and there is no provision for them in all that spacious and convenient club house.

Dr. Rogers took George P. Merrick into his confidence, and between them they held a mysterious conference with every man in the building except Mr. Watterson. The whispering conversations were marked by many shakes of the head and sincere regrets. Dr. Rogers and his lieutenant then turned to the telephone, and here Mr. Merrick's knowledge was expected to bring victory. He confidently rang up John B. Kirk, but there must have been some mistake, for all the satisfaction Mr. Kirk could give was to say he was sorry. Man after man was rung up, but not one of them would incriminate himself.

Evanston hospitality was evidently in eclipse. Some one suggested that perhaps Mr. Watterson did not care for any refreshment. Ah, here was hope! But it was immediately blasted, for Mr. Watterson had a tender solicitude for his travelling companion. Here was a pretty how-de-do, but fortune favored the hospitable.

John M. Allen happened to drop in for a late game of billiards, and he saved the day. Mr. Allen is a jolly Board of Trade man and likewise a good fellow—so good that he is known as "Jack." It happens that Mr. Allen is a Kentuckian, and he is acquainted with the Kentucky thirst and most of its family. The distracted Doctor and his aids appealed to him for help. Couldn't he "do something?" Well, he allowed he could—for a Kentucky gentleman.

Mr. Allen left the club house quietly and went over to the Avenue House or somewhere else. When he came back there was a suspicious bulge in his pocket. He told the conspirators in a whisper that he had "a bottle for Mr. Watterson." Here a new difficulty arose. The club has strict rules about bottles and their contents, and it would not do to display a bottle even for a distinguished guest from Kentucky.

Happy thought. A bright genius suggested that Mr. Watterson and Mr. Allen had a little business they wished to attend to privately. They were accordingly shown into a room by themselves, and, of course, the polite gentlemen of Evanston have not presumed to inquire the nature of their "business." It was noticed that Mr. Allen's pocket did not bulge when he came forth from their privacy, and Mr. Watterson's slight huskiness had disappeared.